

Automated Test Case Generation from Highly Reliable System Requirements Models, Phase I

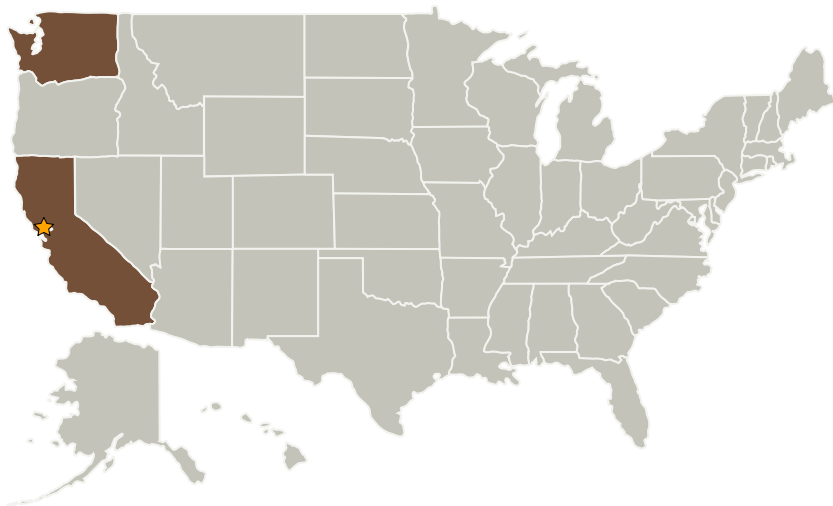
Completed Technology Project (2008 - 2008)



Project Introduction

Software testing is a complex and expensive phase of the software development cycle. Effective software testing is especially important in mission-critical software, where erroneous behavior poses a risk to safety or mission success. Automated test case generation can make testing more efficient and effective, saving resources and reducing risk. Safeware Engineering Corporation proposes to develop the algorithms necessary to streamline software testing by automatically generating test cases directly from SpecTRM-RL models. SpecTRM-RL (Specification Tools and Requirements Methodology - Requirements Language) is a requirements language that was designed to be highly readable, allowing even non-specialists to understand them, but also completely formal. A SpecTRM-RL model specifies the black-box behavior of the system; test cases based on these requirements will focus on the intended behavior of the system. A smaller set of test cases will allow for more rapid error identification, while a larger set will provide more comprehensive coverage. The algorithms will have varying levels of completeness, allowing for a trade-off between test coverage and testing resources. Safeware provides a tool, SpecTRM, which assists analysts with editing, analyzing, and executing formal requirements models. A phase II effort would implement these algorithms, adding test-case generation to SpecTRM.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
Safeware Engineering Corporation	Supporting Organization	Industry	Seattle, Washington

Primary U.S. Work Locations

California	Washington
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Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Grady Lee

Technology Areas

Primary:

- TX11 Software, Modeling, Simulation, and Information Processing
 - └ TX11.1 Software Development, Engineering, and Integrity
 - └ TX11.1.2 Verification and Validation of Software systems